Claims

What is claimed is:

1.   A method for optimizing seek operations in a disc drive having an amplifier for supplying a driving current to drive a voice coil motor, the driving current supplied to the voice coil motor being limited to a maximum driving current, the method comprising steps of:

(a)   determining whether the amplifier saturated during a portion of a seek operation; and

(b)   if the amplifier saturated during the portion of the seek operation, decreasing the maximum driving current.

2.   The method of claim 1, further comprising steps of:

(c)   determining whether the seek operation has completed;

(d)   if the seek operation has completed, determining whether the amplifier saturated during any portion of the seek operation; and

(e)   if the amplifier did not saturate during any portion of the seek operation, increasing the maximum driving current.

3.   The method of claim 1, wherein the seek operation has a length and wherein determining step (a) and decreasing step (b) are performed only if the length of the seek operation is greater than a predetermined minimum seek length.

4.   The method of claim 2, further comprising step of:

(f)   if the amplifier saturated during the portion of the seek operation, asserting a saturation indicator.

5.   The method of claim 4, where the determining step (d) comprises checking the saturation indicator to determine if the amplifier did not saturate during any portion of the seek operation.

6.   The method of claim 2, wherein the amplifier includes a maximum current indicator that specifies a value of the maximum driving current that will be output by the

amplifier, and wherein the decreasing step (b) decreasing the maximum driving current by decreasing the value of the maximum current indicator.

7.   The method of claim 6, wherein the increasing step (e) increases the maximum driving current by increasing the value of the maximum current indicator.

8.   The method of claim 7, wherein the decreasing step (b) decreases the value of the maximum driving current indicator according to an equation decreased_max_current = previous_max_current - K, wherein decreased_max_current is the decreased value of the maximum driving current and K is a predetermined constant.

9.   The method of claim 8, wherein the increasing step (e) increases the value of the maximum driving current indicator according to an equation increased_max_current = previous_max_current - K/2, wherein increased_max_current is the increased value of the maximum driving current.

10.   The method of claim 1, wherein the amplifier includes a maximum current indicator that specifies a value of the maximum driving current that will be output by the amplifier, further comprising steps:

(c)   if it is determined that the amplifier saturated during the portion of the seek operation, asserting a saturation indicator;

(d)   determining whether the seek operation has completed;

(e)   if it is determined that the seek operation has completed, determining whether the saturation indicator is not asserted; and

(f)   if it is determined that the saturation indicator is not asserted, increasing the value of the maximum current.

11.   The method of claim 10, wherein determining step (a), decreasing step (b), determining step (c), determining step (d), increasing step (e), and asserting step (f) are performed only if the length of the seek operation is longer than a predetermined minimum seek length.

12.   A computer-readable medium having computer-executable instructions for performing the steps recited in claim 11.

13.   A method for adaptive seek control in a disc drive having an amplifier for supplying a maximum driving current to drive a voice coil motor, the driving current supplied to the voice coil motor being limited to a maximum driving current, the method comprising steps of:

(a)   detecting a servo sample;

(b)   determining, upon detection of the servo sample, whether a seek operation is being performed;

(c)   if a seek operation is being performed, determining whether the length of the seek operation being performed is longer than a predetermined minimum seek length;

(d)   if it is determined that the length of the seek operation being performed is longer than the predetermined minimum seek length, determining whether the amplifier saturated during the portion of the seek operation; and

(e)   if it is determined that the amplifier saturated during the portion of the seek operation, decreasing the maximum driving current.

14.   The method of claim 13, further comprising steps of:

(f)   if it is determined that the amplifier did not saturated during the portion of the seek operation, determining whether the seek operation has completed; and

(g)   if it is determined that the seek operation has completed, increasing the maximum driving current.

15.   The method of claim 13, further comprising a step of:

(f)   if it is determined that the amplifier saturated during the portion of the seek operation, asserting a saturation indicator.

16.   The method of claim 15, further comprising steps of:

(g)   determining if the seek operation has completed;

(h)   if it is determined that the seek operation has completed, determining if the saturation indicator is asserted; and

(i)   if it is determined that the saturation indicator is not asserted, increasing the maximum driving current.

17.   The method of claim 16, wherein the amplifier includes a maximum current indicator that specifies a value of the maximum driving current that will be output by the amplifier, and wherein the decreasing step (e) decreases the maximum driving current by decreasing the value of the maximum current indicator.

18.   The method of claim 17, wherein the increasing step (i) increases the maximum driving current by increasing the value of the maximum current indicator.

19.   The method of claim 17, wherein the decreasing step (e) decreases the value of the maximum driving current value according to an equation decreased_max_current = previous_max_current - K, wherein decreased_max_current is the decreased value of the maximum driving current and K is a predetermined constant, and wherein the increasing step (e) increases the value of the maximum driving current value according to an equation increased_max_current = previous_max_current - K/2, wherein increased_max_current is the increased value of the maximum driving current.

20.   A system for optimizing notch filter operation in a disc drive by limiting amplifier saturation, comprising;

a disc drive having a voice coil motor, an amplifier for supplying a maximum driving current to drive the voice coil motor, the driving current supplied to the voice coil motor being limited to a predetermined maximum driving current, and a notch filter for modifying a frequency response of the drive current; and

a driving current adjustment means for dynamically defining during drive operation the maximum driving current so as to limit the amount of time the amplifier is saturated.

21.   The system of claim 20, wherein the driving current adjustment means defines the maximum driving current by setting a maximum current value.

22.   The system of claim 21, wherein the maximum current value is stored in a maximum current indicator in the amplifier.

23.   The system of claim 22, wherein the driving current adjustment means performing steps of:

(a)   determining if the amplifier saturated during a prior portion of a seek operation; and

(b)   if the amplifier saturated during the portion of the seek operation, decreasing the maximum current value.

24.   The system of claim 23, wherein the amplifier indicates to the driving current adjustment means if the amplifier saturated during the prior portion of the seek operation.

25.   The system of claim 24, wherein the amplifier indicates to the driving current adjustment means if the amplifier saturated during the prior portion of the seek operation by setting a bit within the amplifier to indicate that the amplifier is in saturation.

26.   The system of claim 25, wherein the seek operation has a length and wherein the driving current adjustment means performs determining step (a) and decreasing step (b) only if the length of the seek operation is longer than a predetermined minimum seek length.

27.   The system of claim 23, wherein the driving current adjustment means further performs steps of:

(c)   determining if the seek operation has completed; and

5   (d)   if it is determined that the seek operation has completed, increasing the maximum current.